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(54) **AUTOMATIC CONVERSATION TECHNIQUES**

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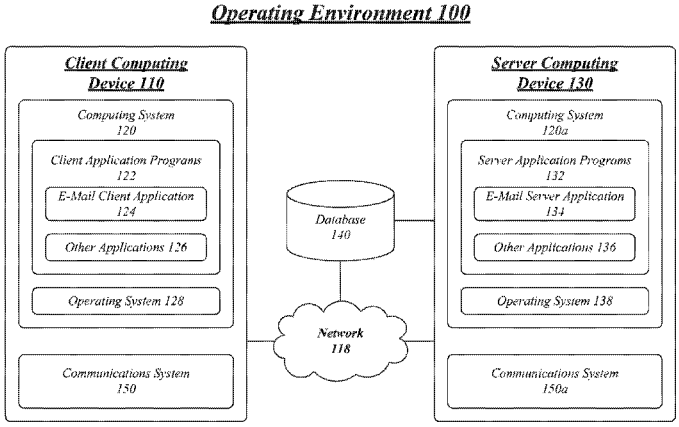
(57) **ABSTRACT**

Automatic conversation techniques are described. An apparatus may comprise a computing device having an incoming message module operative to receive an incoming message, a conversation identification module communicatively coupled to the incoming message module, the conversation identification module operative to determine the incoming message is part of a conversation thread, and associate the incoming message with the conversation thread by setting a conversation identifier property of the incoming message to a conversation identifier for the conversation thread, and a conversation manager module communicatively coupled to the conversation identification module, the conversation manager module operative to determine a conversation rule is associated with the conversation thread, and apply the conversation rule to the incoming message. Other embodiments are described and claimed.

17 Claims, 10 Drawing Sheets



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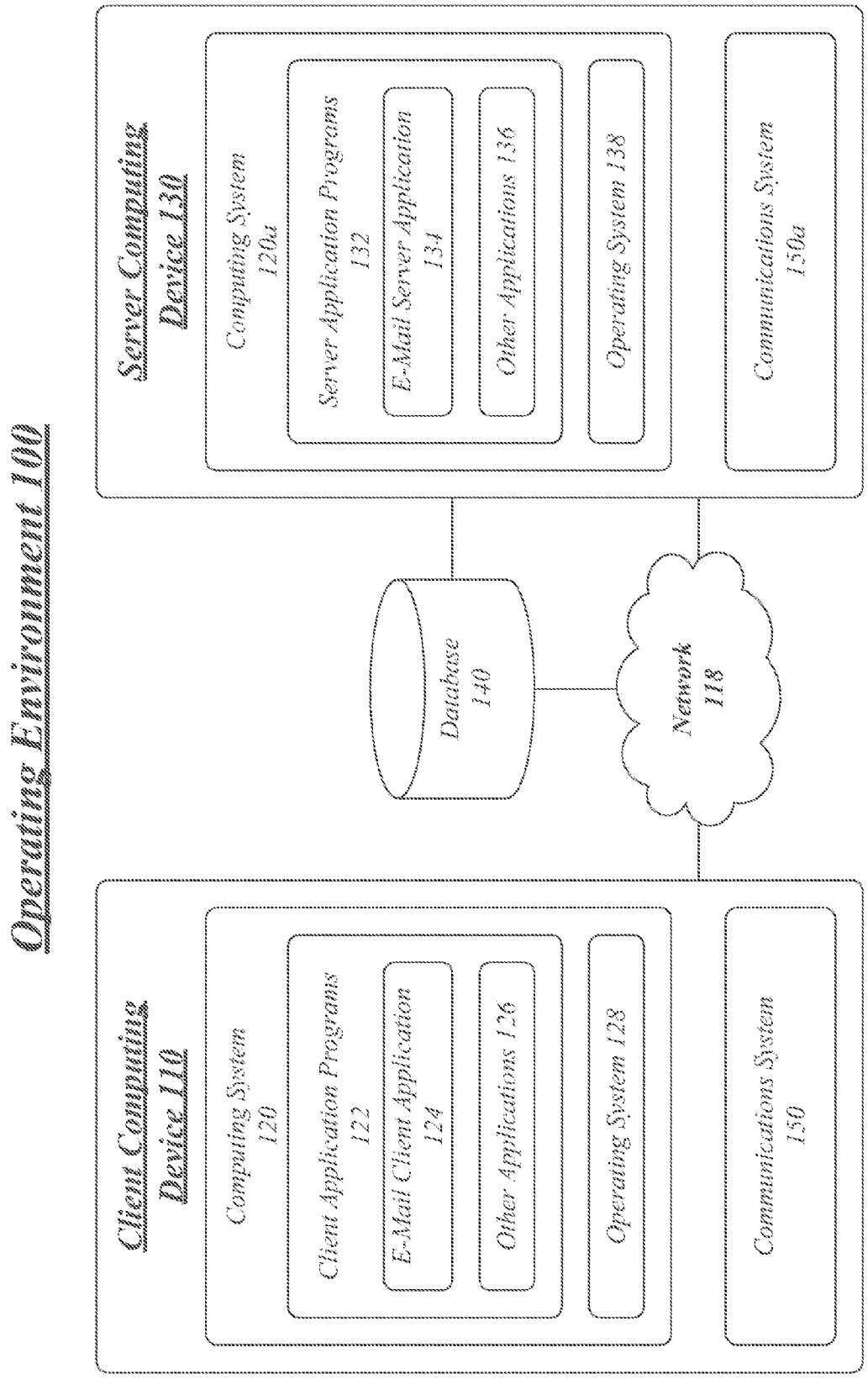
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FIG. 1

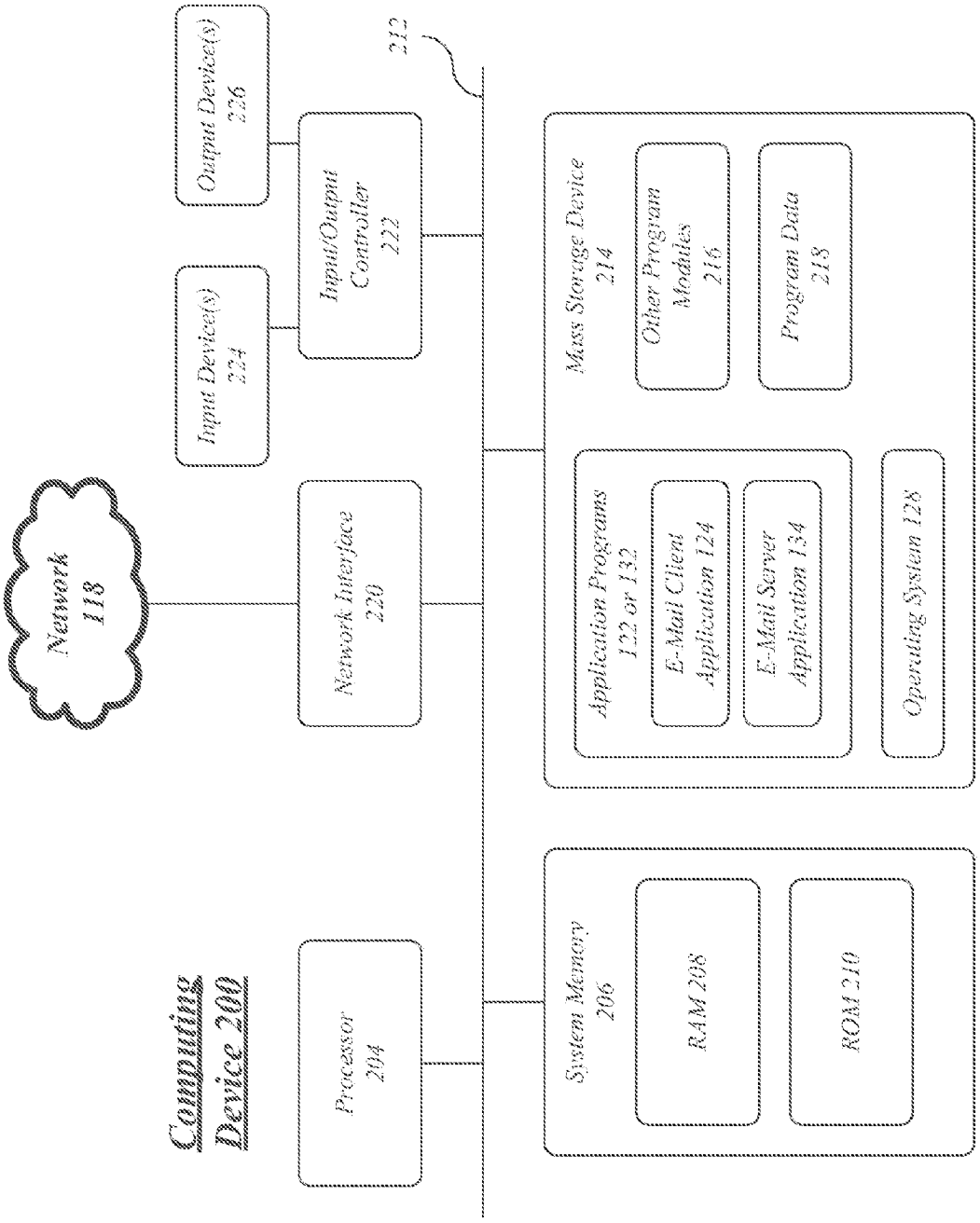
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FIG. 2

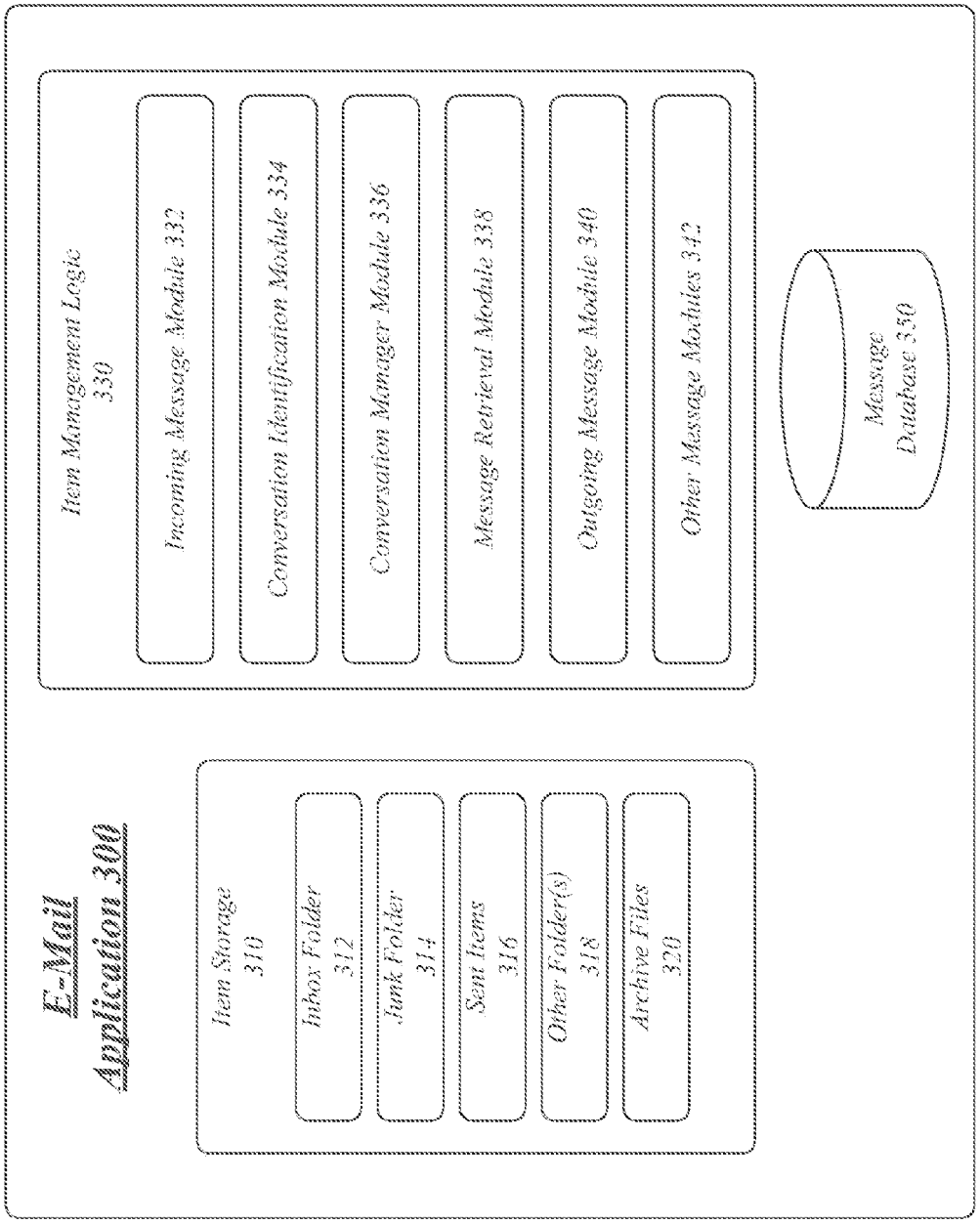
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FIG. 3

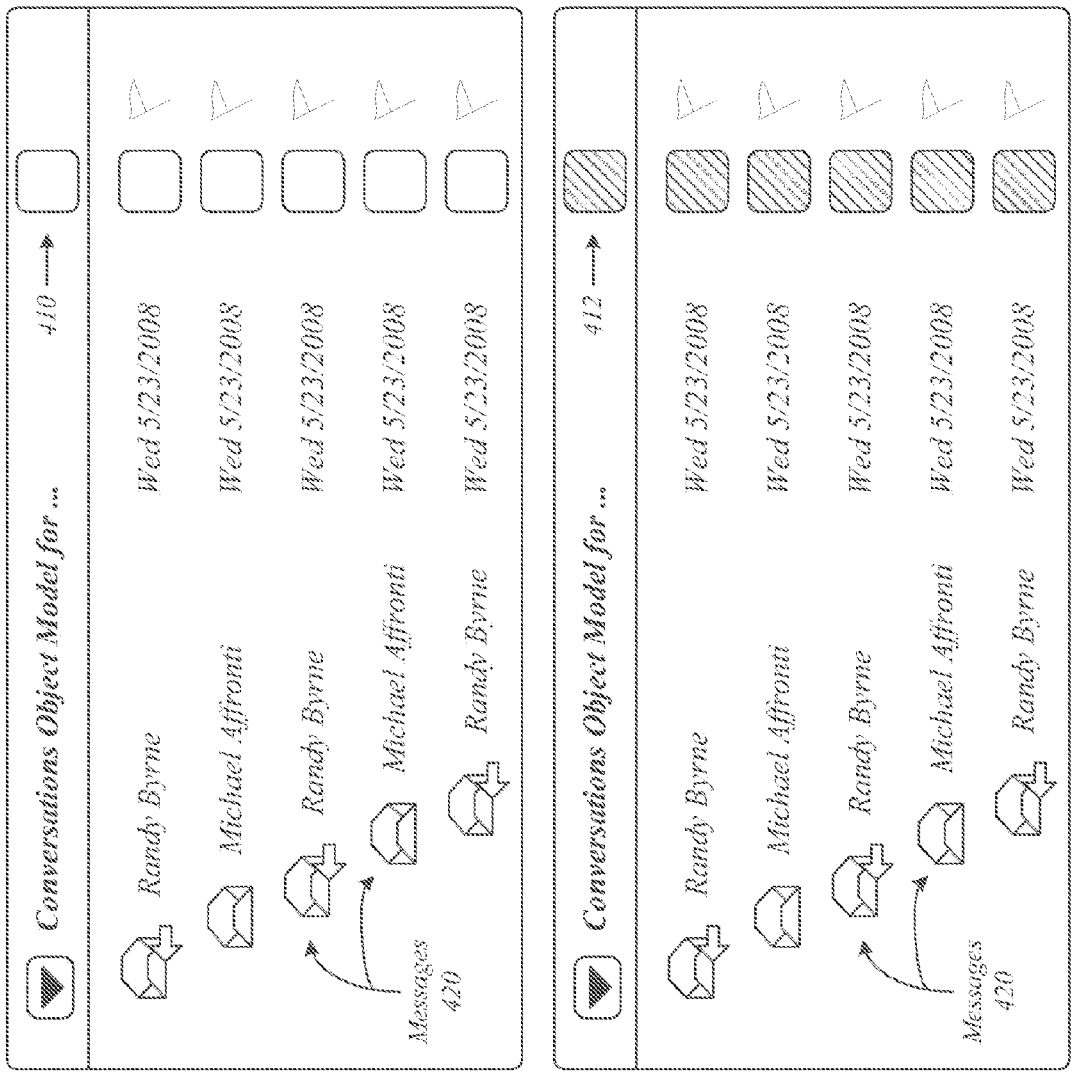
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FIG. 4

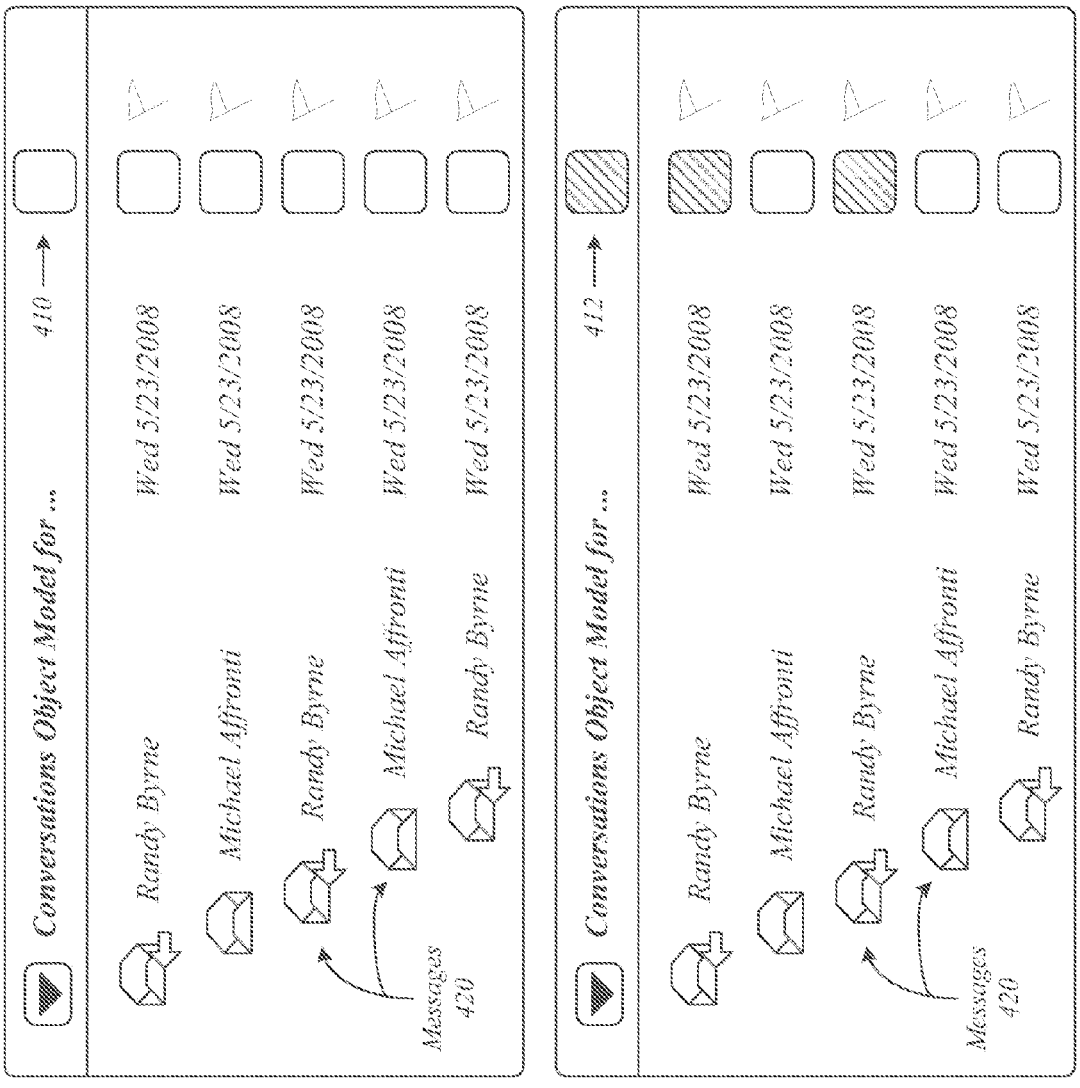
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FIG. 5

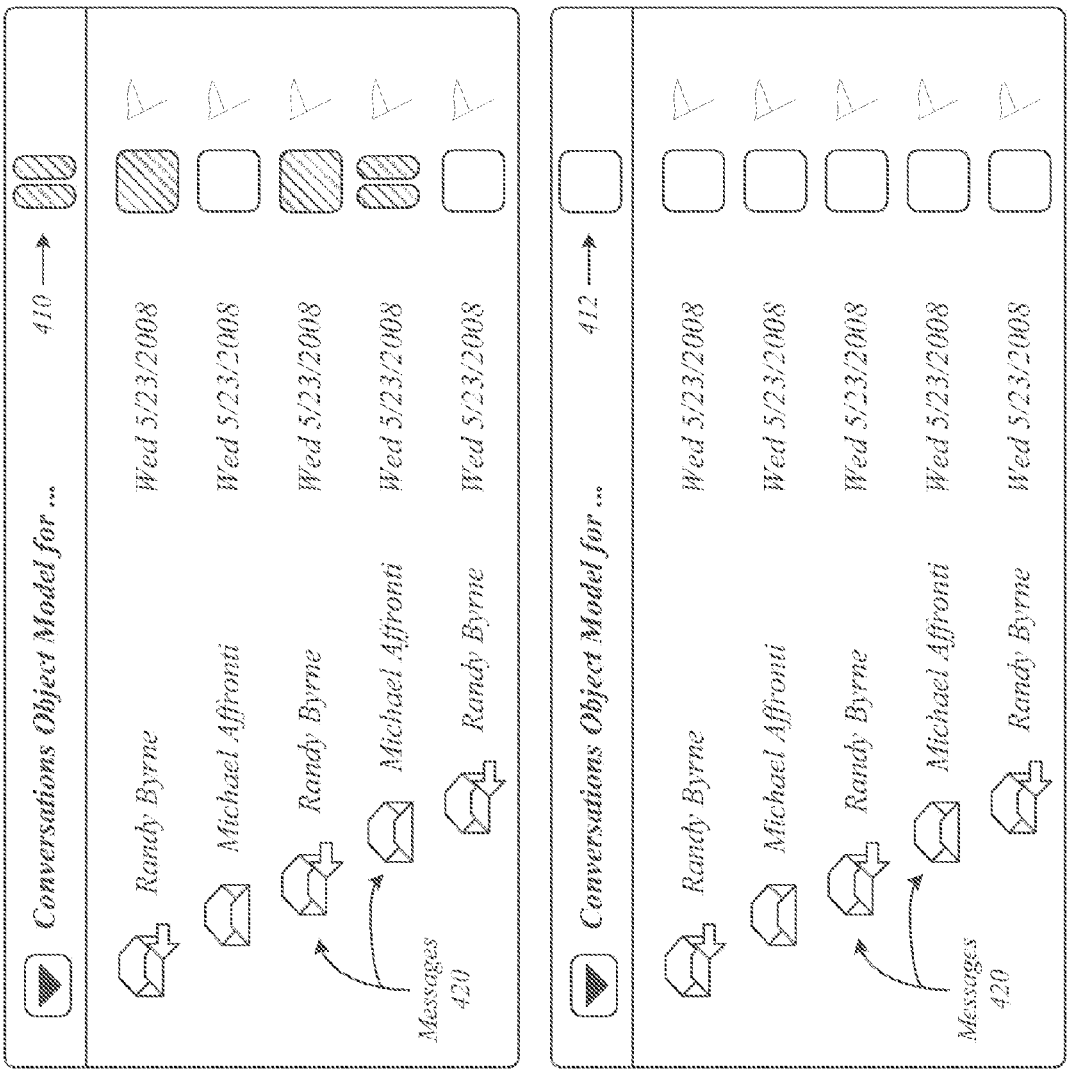
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FIG. 6

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FIG. 7

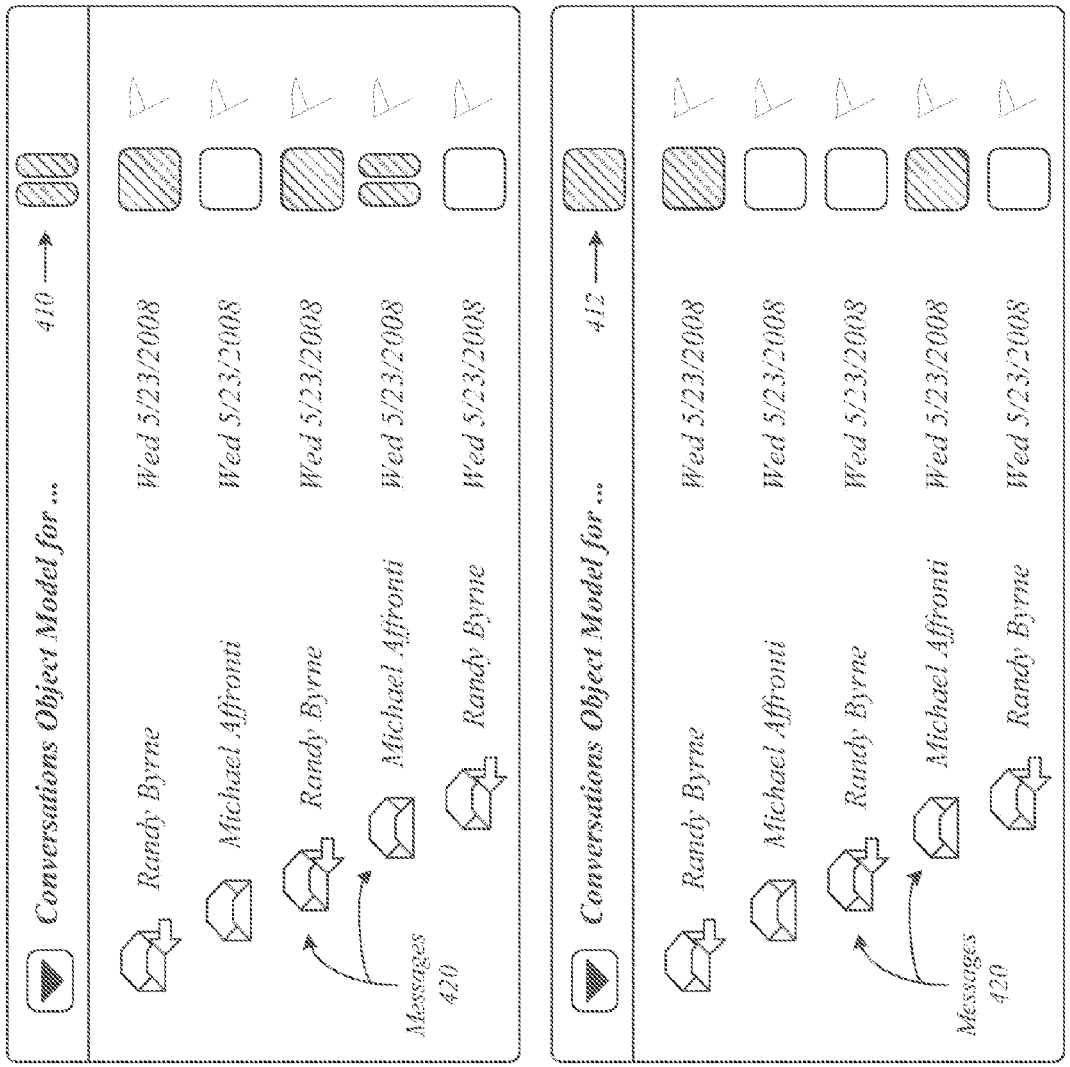
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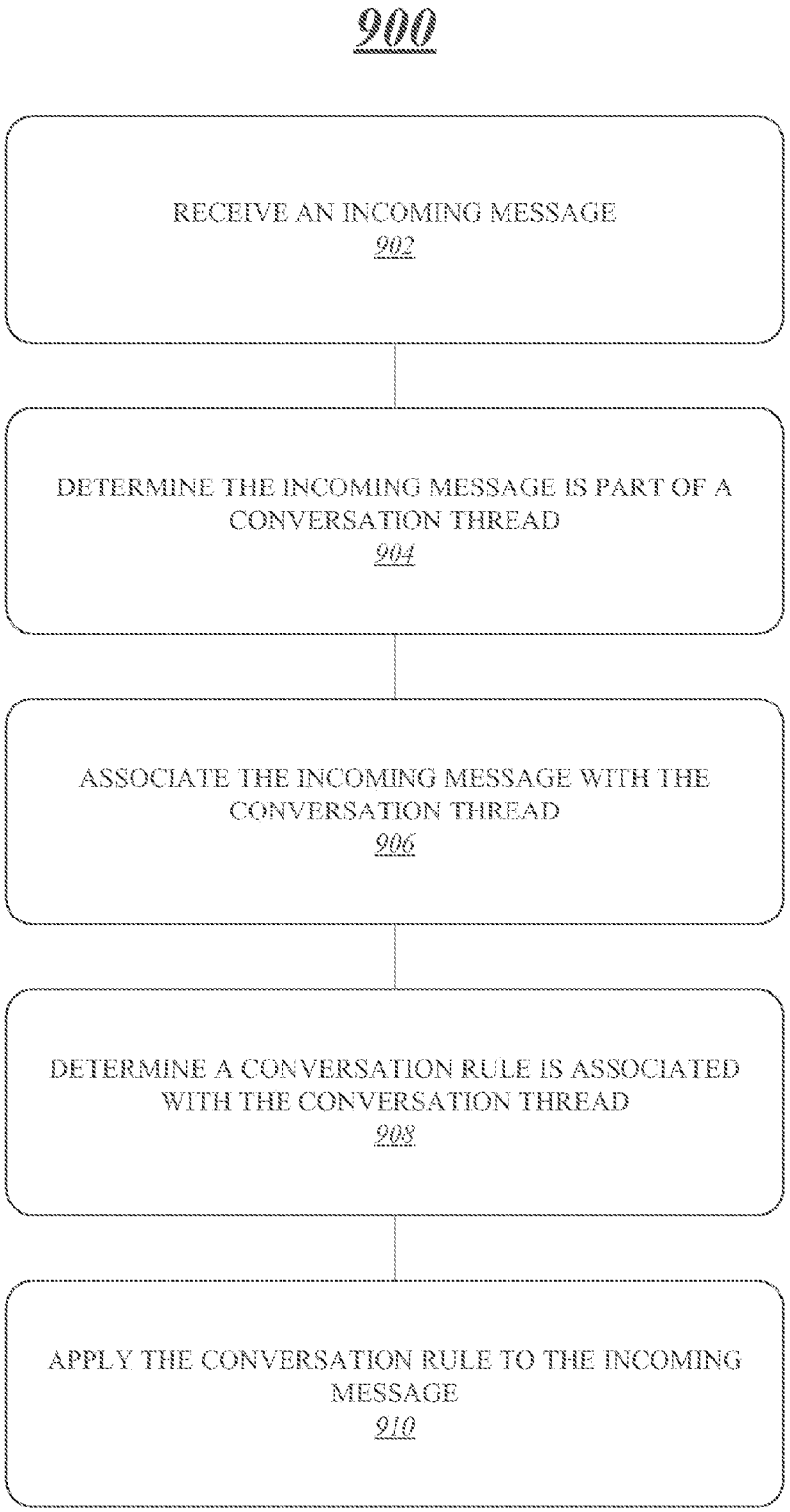
FIG. 8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RECEIVE AN INCOMING MESSAGE
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DETERMINE THE INCOMING MESSAGE IS PART OF A CONVERSATION THREAD
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ASSOCIATE THE INCOMING MESSAGE WITH THE CONVERSATION THREAD
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DETERMINE A CONVERSATION RULE IS ASSOCIATED WITH THE CONVERSATION THREAD
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APPLY THE CONVERSATION RULE TO THE INCOMING MESSAGE
910

FIG. 9

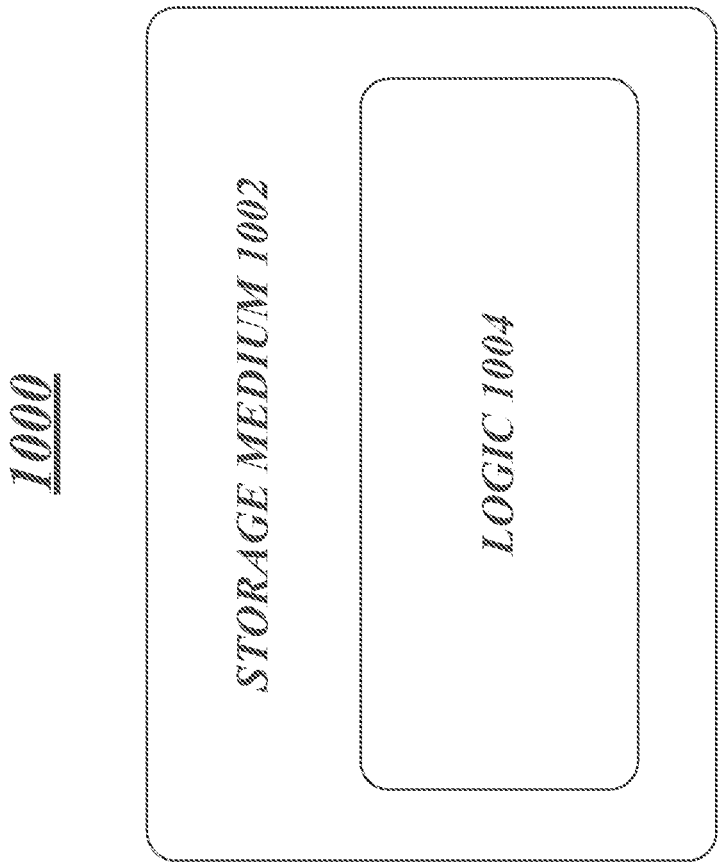

FIG. 10

AUTOMATIC CONVERSATION TECHNIQUES

CROSS-REFERENCE TO RELATED PATENT APPLICATIONS

This patent application is a continuation of co-pending U.S. patent application Ser. No. 12/144,642, now issued as U.S. Pat. No. 8,402,096, filed Jun. 24, 2008 and entitled "Automatic Conversation Techniques," the disclosure of which is incorporated herein, in its entirety, by reference.

BACKGROUND

Electronic mail (E-mail) applications provide users with the ability to store messages in logical folders within the interface similar to that provided by many file systems. E-mail applications also may allow users to group stored messages into logical "conversations." Each conversation is a group of related messages including a root message and replies to the root message or to one another. When arranged by conversation, messages are displayed in a user interface of the e-mail application as a list of conversations grouped by message subject or thread. The conversations may be sorted by date, and the messages within each conversation may be sorted based on who replied to whom.

Despite the convenience offered by the conversation groups, some e-mail applications limit operations for a conversation to individual conversation items. For example, a user may not desire to engage in a conversation thread discussing lunch options with some colleagues. The user may need to delete the individual conversation items as they arrive to keep their inbox clear. Such operations may be tedious and time consuming for a user, particularly given the increasing volumes of e-mail messages a user might receive on any given day. Consequently, improvements to item management and display techniques are needed to solve these and other problems and to enhance the experience of users in various usage scenarios.

SUMMARY

This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

Various embodiments are generally directed to automatic conversation techniques for a message application. Some embodiments are particularly directed to automatic conversation actions that may be applied across an entire conversation group or thread for a message application, such as an e-mail application, for example.

One embodiment, for example, may comprise an apparatus such as a computing device having a message application program. The message application program may comprise, among other elements, an incoming message module operative to receive an incoming message. The message application program may also comprise a conversation identification module communicatively coupled to the incoming message module, the conversation identification module operative to determine the incoming message is part of a conversation thread, and associate the incoming message with the conversation thread by setting a conversation identifier property of the incoming message to a conversation identifier for the conversation thread. The message application program may further comprise a conversation manager module communicatively coupled to the conversation identification module, the conversation manager module operative to determine a conversation rule is associated with the conversation thread, and apply the conversation rule to the incoming message. Other embodiments are described and claimed.

These and other features and advantages will be apparent from a reading of the following detailed description and a review of the associated drawings. It is to be understood that both the foregoing general description and the following detailed description are explanatory only and are not restrictive of aspects as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates an embodiment of an operating environment.

FIG. **2** illustrates an embodiment of a computing device.

FIG. **3** illustrates an embodiment of an e-mail application.

FIG. **4** illustrates an embodiment of a first conversation view.

FIG. **5** illustrates an embodiment of a second conversation view.

FIG. **6** illustrates an embodiment of a third conversation view.

FIG. **7** illustrates an embodiment of a fourth conversation view.

FIG. **8** illustrates an embodiment of a fifth conversation view.

FIG. **9** illustrates an embodiment of a logic flow.

FIG. **10** illustrates an embodiment of an article.

DETAILED DESCRIPTION

Various embodiments include physical or logical structures arranged to perform certain operations, functions or services. The structures may comprise physical structures, logical structures or a combination of both. The physical or logical structures are implemented using hardware elements, software elements, or a combination of both. Descriptions of embodiments with reference to particular hardware or software elements, however, are meant as examples and not limitations. Decisions to use hardware or software elements to actually practice an embodiment depends on a number of external factors, such as desired computational rate, power levels, heat tolerances, processing cycle budget, input data rates, output data rates, memory resources, data bus speeds, and other design or performance constraints. Furthermore, the physical or logical structures may have corresponding physical or logical connections to communicate information between the structures in the form of electronic signals or messages. The connections may comprise wired and/or wireless connections as appropriate for the information or particular structure. It is worthy to note that any reference to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment. The appearances of the phrase "in one embodiment" in various places in the specification are not necessarily all referring to the same embodiment.

Various embodiments may be directed to automatic conversation techniques for a message application. The automatic conversation techniques may be implemented for any message application. Examples of message applications may include without limitation an e-mail message application, text message application, short message service (SMS) message application, multimedia message server (MMS) message

application, voice message application, video message application, and so forth. In one embodiment, the automatic conversation techniques may be described with reference to an e-mail application by way of example and not limitation. Specific implementations may implement the automatic conversation techniques with other messaging applications, however, and still fall within the scope of the embodiments.

Various embodiments may be directed to automatic conversation techniques for a message application such as an e-mail application. In general, an e-mail application allows users to compose, send, and receive messages over electronic communication systems. In some embodiments, the described techniques may be implemented by one or more elements of a client/server e-mail messaging system. In such embodiments, the server may support a variety of messaging clients, accept requests and data from clients, process the requests, store the data, and return the processing results to the clients. Accordingly, one or more of the item aggregation and display techniques may be implemented as features within client-based e-mail applications, server-based e-mail applications including a web-based e-mail applications providing access to e-mail services via a web browser, and/or by other types of applications, programs, or services that interact with e-mail.

In some embodiments, one or more of the automatic conversation techniques can be implemented within an e-mail client application or software program such as MICROSOFT OFFICE OUTLOOK® application software from Microsoft Corporation, Redmond, Wash. In such embodiments, the described techniques may be performed by the e-mail client application in either an online or offline mode. In an offline mode, the e-mail client application may perform one or more automatic conversation techniques on locally stored or cached e-mail messages. It can be appreciated that the described techniques may be implemented by any type of e-mail client in accordance with the described embodiments including, without limitation, Messaging Application Programming Interface (MAP I) clients, Hypertext Transfer Protocol (HTTP) clients, Post Office Protocol 3 (POP3) clients, Internet Message Access Protocol (IMAP or IMAP4) clients, Network News Transfer Protocol (NNTP) clients, and so forth.

Alternatively or additionally, one or more automatic conversation techniques may be implemented as features within a server-based e-mail application or software program such as MICROSOFT EXCHANGE SERVER® from Microsoft Corporation, Redmond, Wash. The server may provide e-mail, calendaring, contacts and tasks functionality and support for mobile and web-based access to information, as well as data storage. The server may comprise or communicate with a message store for storing items including e-mail messages and other data in mailboxes and folders and may provide an interface for communicating with various e-mail clients and allowing access to the message store. The server also may comprise or communicate with a directory containing information about the users of the system and configuration information which may be used by a message transfer subsystem to perform various routing and transfer operations for e-mail messages intended for recipients on the server, another server in the same organization, and/or for recipients on the Internet or other messaging systems.

In some embodiments, the server may support various Web services including web access, mobile access, and synchronization functionality, Internet Information Services (IIS) and Internet Server Application Programming Interface (ISAPI) applications providing SMTP, NNTP, IMAP4, and POP3 services to allow Internet users to access to messaging data over a variety of Internet access protocols and HTTP-based protocols including remote procedure call (RPC) over HTTP communication. In some implementations, data may be formatted as compressed Wireless Binary XML (WbXML) data to make efficient use of bandwidth for mobile clients. In addition to standard Internet protocols, the server also may support communication over proprietary or non-standard protocols when used by a company or other organization.

The e-mail application may provide users with the ability to store messages in logical folders within the interface similar to that provided by many file systems. It can be appreciated that the term folder may refer to any collection of items however stored and/or represented in a user interface. While some operating systems or applications may not use the term folder when referring to a collection of items, such scenarios are intended to be covered by embodiments that describe and illustrate folders.

The e-mail application also may allow users and/or logic to group stored messages into logical conversations to form a conversation group or conversation thread. Each conversation may comprise a group of related messages including, for example, a root message and replies to the root message or to one another. When a user selects to arrange messages by conversation, the messages are displayed in a user interface of the email application as a list of conversations which may be grouped by message subject or thread. The conversations may be sorted by date, and the messages within each conversation may be sorted based on who replied to whom.

In some cases, the messages of a conversation may be stored across multiple folders. For example, users may manually organize messages into various folders. Users also may set one or more filtering rules for automatically separating e-mail messages into certain folders based on sender, subject, or other criteria. In addition, a reply message sent by a user may be stored within the sent items folder of the user.

Despite the convenience offered by the conversation threads, some e-mail applications limit operations for a conversation to individual conversation items. For example, a user may not desire to engage in a conversation thread discussing lunch options with some colleagues. The user may need to delete the individual conversation items as they arrive to keep their inbox clear. Such operations may be tedious and time consuming for a user, particularly given the increasing volumes of e-mail messages a user might receive on any given day.

To solve these and other problems, various embodiments may implement various automatic conversation techniques for a message application. Some embodiments are particularly directed to automatic conversation techniques that may be applied across an entire conversation group or conversation thread for a message application, such as an e-mail application, for example.

One embodiment, for example, may comprise an apparatus such as a computing device having a message application program, such as an e-mail application program. The message application program may comprise, among other elements, an incoming message module operative to receive an incoming message. The message application program may also comprise a conversation identification module communicatively coupled to the incoming message module, the conversation identification module operative to determine the incoming message is part of a conversation thread, and associate the incoming message with the conversation thread by setting a conversation identifier property of the incoming message to a conversation identifier for the conversation thread. The message application program may further com-

prise a conversation manager module communicatively coupled to the conversation identification module, the conversation manager module operative to determine a conversation rule is associated with the conversation thread, and apply the conversation rule to the incoming message. In this manner, a user needs to establish a conversation rule once, and the conversation rule is automatically applied to all the stored messages in a conversation thread, as well as new incoming messages that are part of the same conversation thread. As a result, a user may have an enhanced messaging experience.

More particularly, the conversation manager module implements automatic conversation techniques in the form of conversation level actions that may be applied across an entire conversation group or conversation thread. Conversation level actions typically affect some or all messages in the entire conversation thread. By way of contrast, item level actions typically affect a single message item. Examples of conversation rules may include without limitation an "always delete" conversation rule, an "always move" conversation rule, an "always categorize" conversation, among others. These are merely a few examples, and any number of conversation level actions may be implemented for a conversation thread as desired for a given implementation. The embodiments are not limited in this context.

FIG. **1** illustrates a block diagram for an operating environment **100** suitable for practicing the various embodiments. The operating environment **100** may comprise elements designed for implementation by a single entity environment or a multiple entity distributed environment. Each element may be implemented as a hardware element, software element, or any combination thereof, as desired for a given set of design parameters or performance constraints. Examples of hardware elements may include devices, components, processors, microprocessors, circuits, circuit elements (e.g., transistors, resistors, capacitors, inductors, and so forth), integrated circuits, application specific integrated circuits (ASIC), programmable logic devices (PLD), digital signal processors (DSP), field programmable gate array (FPGA), memory units, logic gates, registers, semiconductor device, chips, microchips, chip sets, and so forth. Examples of software elements may include any software components, programs, applications, computer programs, application programs, system programs, machine programs, operating system software, middleware, firmware, software modules, routines, subroutines, functions, methods, interfaces, software interfaces, application program interfaces (API), instruction sets, computing code, computer code, code segments, computer code segments, words, values, symbols, or any combination thereof.

As used herein the terms "system," "subsystem," "component," and "module" are intended to refer to a computer-related entity, comprising either hardware, a combination of hardware and software, software, or software in execution. For example, a component can be implemented as a process running on a processor, a processor, a hard disk drive, multiple storage drives (of optical and/or magnetic storage medium), an object, an executable, a thread of execution, a program, and/or a computer. By way of illustration, both an application running on a server and the server can be a component. One or more components can reside within a process and/or thread of execution, and a component can be localized on one computer and/or distributed between two or more computers as desired for a given implementation. The embodiments are not limited in this context.

In the illustrated embodiment shown in FIG. **1**, the operating environment **100** may comprise, among other elements, a client computing device **110** and a server computing device **130**. The computing devices **110**, **130** may be implemented utilizing any suitable electronic device having computing capabilities and communications capabilities. Examples for computing devices **110**, **130** may include without limitation a mobile device, a personal digital assistant, a mobile computing device, a smart phone, a cellular telephone, a handset, a one-way pager, a two-way pager, a messaging device, a computer, a personal computer (PC), a desktop computer, a laptop computer, a notebook computer, a handheld computer, a server, a server array or server farm, a web server, a network server, an Internet server, a work station, a mini-computer, a main frame computer, a supercomputer, a network appliance, a web appliance, a distributed computing system, multiprocessor systems, processor-based systems, consumer electronics, programmable consumer electronics, television, digital television, set top box, wireless access point, base station, subscriber station, mobile subscriber center, radio network controller, router, hub, gateway, bridge, switch, machine, or combination thereof. Although the operating environment **100** as shown in FIG. **1** has a limited number of nodes in a certain topology, it may be appreciated that the operating environment **100** may include more or less nodes in alternate topologies as desired for a given implementation.

The computing devices **110**, **130** may be communicatively coupled via a network **118** and appropriate wireless or wired communications media. The computing devices **110**, **130** may coordinate operations between each other. The coordination may involve the uni-directional or bi-directional exchange of information. For instance, the computing devices **110**, **130** may communicate information over the network **118**. The network **118** may comprise a packet-switched network, a circuit-switched network, or a combination of both. The information can be implemented as data messages sent across various network interfaces. Exemplary network interfaces include parallel interfaces, serial interfaces, and bus interfaces.

The computing devices **110**, **130** may implement respective computing systems **120**, **120***a*. The computing systems **120**, **120***a* may include various computing elements, such as one or more processors, co-processors, memory units, chipsets, controllers, peripherals, interfaces, oscillators, timing devices, video cards, audio cards, multimedia input/output (I/O) components, and so forth. The computing systems **120**, **120***a* may implement, among other elements, respective client application programs **122** and server application programs **132**. In the example illustrated in FIG. **1**, the client application programs **122** may comprise an e-mail client application **124** and other applications **126**, and the server application programs **132** may comprise an e-mail server application **134** and other applications **136**. In various implementations, the e-mail client application **124** and/or e-mail server application **134** may perform one or more item aggregation and display techniques in accordance with the described embodiments.

The applications **126** may comprise one or more types of application programs supporting operation of the client computing device **110**. Exemplary application programs may include, without limitation, a web browser application, telephone application (e.g., cellular, VoIP, PTT), networking application, messaging application (e.g., 1M, SMS, MMS), calendar application, contacts application, tasks application, word processing application, spreadsheet application, database application, media application (e.g., video player, audio player, multimedia player, digital camera, video camera, media management), location based services (LBS) application, gaming application, and so forth.

The applications **136** may comprise one or more types of application programs supporting operation of the server computing device **130**. In various implementations, the applications **136** may include server application programs supporting operation of the server computing device **130** as an e-mail server, a web server, and/or file server in accordance with the described embodiments. In some cases, one or more of the applications **136** may comprise a network, server or web-based version of one or more of the applications **126**. In such cases, the applications **126**, **136** may operate separately, such as when the client computing device **110** is offline, or may interoperate when the client computing device **110** is online and connected to the server computing device **130** via the network **118**.

The computing systems **120**, **120***a* also may comprise respective operating systems **128**, **138** suitable for controlling the operation of the client computing device **110** and the server computing device **130**. In some embodiments, the operating systems **128**, **138** may comprise respective client and server versions of an operating system such as a MICROSOFT WINDOWS® operating system from Microsoft Corporation, Redmond, Wash. It can be appreciated that other suitable operating systems may be used for the client computing device **110** and/or the server computing device **130**.

The computing devices **110**, **130** may comprise or communicate with a data store for item storage such as e-mail messages and other data in mailboxes and folders. With reference to FIG. **1**, the data store may be implemented by a database **140**. In such implementations, the server computing device **130** may provide the client computing device **110** with access to the database **140** when connected via the network **118**. Alternatively or additionally, the client computing device **110** may directly access the database **140** via the network **118**. While shown as being separate elements for purposes of illustration, it can be appreciated that in some embodiments, the database **140** may form part of the client computing device **110** and/or the server computing device **130**. It also can be appreciated that the data store can reside on the client computing device **110**, the server computing device **130**, and/or the database **140** and that, in some embodiments, the client computing device **110**, the server computing device **130**, and/or the database **140** may store respective data stores which may be synchronized with each other.

In addition to respective computing systems **120**, **120***a*, the computing devices **110**, **130** may implement respective communications system **150**, **150***a*. The communications systems **150**, **150***a* may include various communications elements, such as a transmitter, receiver, transceiver, radio, network interface, baseband processor, antenna, amplifiers, filters, and so forth. In one embodiment, for example, the computing devices **110**, **130** may be implemented using a computing and communications architecture as described with reference to FIG. **2**.

FIG. **2** provides an illustrative architecture for a computing device **200** suitable for practicing the various embodiments. The computing device **200** may be representative of, for example, the client computing device **110** and/or the server computing device **130**. As shown, the computing device **200** illustrates a conventional computing architecture for a personal or server computer, including a processing system comprising a processor **204** and a system memory **206**. The system memory **206** may include, among other types of memory, a random access memory (RAM) **208** and a read-only memory (ROM) **210**. An input/output (I/O) system, such as a basic I/O system (BIOS), may implement routines to assist in transferring information between elements within the computing device **200**, such as during startup operations, using logic stored in the ROM **210**. A system bus **212** communicatively couples all of the elements of the computing device **200** to facilitate information transfer and data processing operations.

The computing device **200** further includes a mass storage device **214** for storing an operating system, such as the operating system **128**, as well as other program modules **216** and program data **218**. The mass storage device **214** also may store various application programs, as described in greater detail below.

The mass storage device **214** is connected to the processor **204** through a mass storage controller (not shown) connected to the system bus **212**. The mass storage device **214**, and its associated computer-readable media, provides non-volatile storage for the computing device **200**. Although the description of computer-readable media contained herein refers to a mass storage device, such as a hard disk or CD-ROM drive, it should be appreciated by those skilled in the art that computer-readable media can be any available media that can be accessed by the computing device **200**. By way of example, and not limitation, computer-readable media may comprise computer storage media and communication media. Computer storage media includes volatile and non-volatile, removable and non-removable media implemented in any method or technology for storage of information such as computer-readable instructions, data structures, program modules or other data. Computer storage media includes, but is not limited to, RAM, ROM, EPROM, EEPROM, flash memory or other solid state memory technology, CD-ROM, DVD, or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by the computer.

According to various embodiments, the computing device **200** may operate in a networked environment using logical connections to remote computers through a network **118** which, in some implementations, may be a Transmission Control Protocol (TCP) and Internet Protocol (IP) network, such as the Internet. The computing device **200** may connect to the network **118** through a network interface **220** (e.g., a wired or wireless network interface) connected to the system bus **212**. It can be appreciated that the network **118** may comprise any type of network in accordance with the described embodiments including, without limitation, a wide area network (WAN), a local area network (LAN), and/or a cellular telephone network and that the network interface **220** may support various transport layers such as GPRS, CDMA 1×RTT, IEEE 802.11, and others for connecting to a variety of networks and/or remote computer systems.

The computing device **200** may include an I/O controller **222** for receiving and processing input from a number of input devices **224**. A user may enter commands and information into the computing device **200** through various input devices **224** such as a keyboard and pointing device, such as a mouse, trackball or touch pad. Other examples of input devices **224** may include a microphone, joystick, game pad, satellite dish, scanner, or the like. The input devices **224** may be connected to the processor **204** through the I/O controller **222** that is coupled to the system bus **212**, but may be connected by other interfaces and bus structures, such as a parallel port, game port or a universal serial bus (USB). The I/O controller **222** also may provide output to various output devices **224**, such as a monitor or other type of display device that is connected via the I/O controller **222** to the system bus **212**. In various implementations, the display device may present one or more user interfaces (UIs) to a user in accordance with the

described embodiments. In addition to a display device, the I/O controller **222** may provide output to a printer, speakers, and other peripheral devices.

As mentioned above, a number of program modules and data files may be stored in the mass storage device **214** and RAM **208** of the computing device **200**. In the example illustrated in FIG. **2**, the mass storage device **214** and RAM **208** may store the operating system **128** as well as one or more client application programs **122** including the e-mail client application **124** and other applications **126**. It can be appreciated that in some implementations, the mass storage device **214** and RAM **208** may store the operating system **138** as well as one or more server application programs **132** including the e-mail server application **134** and other applications **136**.

According to various embodiments, the e-mail client application **124** and/or the e-mail server application **134** may implement one or more automatic conversation techniques. In one embodiment, for example, the e-mail client application **124** and/or the e-mail server application **134** may be implemented as described with reference to FIG. **3**.

FIG. **3** illustrates one embodiment of an e-mail application **300** suitable for practicing the various embodiments. With reference to FIGS. **1** and **2**, in some implementations, the e-mail application **300** may operate as the e-mail client application **124** as one of the client application programs **122** that reside on the computing device **110**. Alternatively or additionally, the e-mail application **300** may operate as the e-mail server application **134** as one of the server application programs **132** that reside on the computing device **130**. Further, one or more parts of the e-mail application **300** may be distributed between the e-mail client application **124** and the e-mail server application **134**. One or more parts of the e-mail application **300** also may be implemented by application programs in the RAM **208** of the computing device **200**, on another remote computer, or in any other variation as would occur to one in the computer software art.

As shown, the e-mail application **300** may include item storage **310**. While the item storage **310** is shown as part of the e-mail application **300** for purposes of illustration, and not limitation, it can be appreciated that the item storage **310** can reside in various locations in accordance with the described embodiments. For instance, the item storage **310** may reside on the client computing device **110**, the server computing device **130**, and/or the database **140**. As one non-limiting example, the item storage **310** of the e-mail application **300** can reside within the program data **218** of the computing device **200**, either in a database and/or in one or more files. As another non-limiting example, the item storage **310** can reside all or in part in a directory specified by the user in the file system of an operating system such as operating system **128** or operating system **138**. As another non-limiting example, the item storage **310** can reside all or in part on the database **140** which may be accessed or hosted by the server computing device **130**.

In the example illustrated in FIG. **3**, the item storage **310** includes an inbox folder **312**, a junk folder **314**, a sent items folder **316**, one or more other e-mail folders **318**, and one or more archive files **320**. It can be appreciated that the term folder or file may refer to any collection of items however stored and/or represented in a user interface. While some operating systems or applications may not use the term folder when referring to a collection of items, such scenarios are intended to be covered by embodiments that described and illustrate folders. It also can be appreciated that other folder variations and files may be implemented in accordance with the described embodiments.

The e-mail application **300** may provide the user with the ability to store items in certain logical folders such as the inbox folder **312**, the junk folder **314**, the sent items folder **316**, and one or more other e-mail folders **318** such as a user-created folder for storing items associated with a certain sender or recipient, subject (e.g., project), content (e.g., text, attachment), or other criteria. The user may interface with the e-mail application **300** and manually organize items into various folders. The user also may set one or more filtering rules for automatically separating items into certain folders based on sender, recipient, subject, content, or other criteria. In addition, replies message sent by the user in response to other messages may be stored within the sent items folder **316**. The users also may store older items in one or more archive files **320** which may be implemented as one or more Personal Storage Table extension (.pst) files on the local hard drive of the user and/or any other suitable archiving data structure.

The e-mail application **300** may allow the user to group stored messages into logical conversations. Each conversation may comprise a group of related items including, for example, a root message and replies to the root message or to one another. In some cases, the related items of a conversation may be stored across multiple storage locations such as across two or more of the inbox folder **312**, junk folder **314**, sent items folder **316**, other e-mail folders **318**, and archive files **320**.

As shown, the e-mail application **300** may include item management logic **330** which may be responsible for carrying out some or all of the item aggregation and display techniques described herein. In the example illustrated in FIG. **3**, the item management logic **330** includes various modules, with each module representing discrete sets of logic for various operations performed by the item management logic **330**.

The item management logic **330** also may comprise other logic for operating the e-mail application **300** which may support various other operations and capabilities. Exemplary operations and capabilities may include sending and receiving operations, storing and organizing operations, filtering operations, sorting operations, searching operations, previewing operations, capabilities for synchronization, capabilities for accessing messaging data including web access and mobile access, capabilities for detecting the online/offline state of users, capabilities for integrating the e-mail application **300** with calendar, contacts and tasks functionality, and/or any other features in accordance with the described embodiments.

In some implementations, the item management logic **330** may reside within the e-mail application **300** as part of the client application programs **122** on the client computing device **110** or as part of the server application programs **132** on the server computing device **130**. It can be appreciated, however, that the item management logic **330** can alternatively or additionally be embodied as computer-executable instructions stored on one or more types of computer-readable storage media in a variety of locations in accordance with the described embodiments.

Although the example illustrated in FIG. **3** includes a particular set of logic, it can be appreciated that the item management logic **330** provides an exemplary implementation of the general functionality. It is to be understood that the sequence of logic does not necessarily have to be executed in the order presented unless otherwise indicated. In addition, while the item management logic **330** may be described as performing a certain sequence of steps, other sequences of steps may also be performed according to alternative embodiments. Moreover, some individual steps performed by the item management logic **330** may include multiple sub-steps

that may be performed in various sequences as appropriate to the individual step. Furthermore, additional steps may be performed or some steps may be omitted by the item management logic **330** depending on the particular implementation.

In the illustrated embodiment shown in FIG. **3**, the item management logic **330** may be subdivided into an incoming message module **332**, a conversation identification module **334**, a conversation manager module **336**, a message retrieval module **338**, and an outgoing message module **340**. It should be appreciated that these modules may share one or more common instructions. Furthermore, it should be appreciated that the item management logic **330** may include other message modules **342** in addition to the illustrated modules to provide additional message functionality. For instance, the item management logic may include a message module that filters out "spam" e-mail messages.

When executed by processor **204**, incoming message module **332** interacts with operating system **128** to receive incoming e-mail messages that are received from network **118** by network interface **220**. For instance, incoming message module **332** may use an interface provided by operating system **128** to configure a callback that causes operating system **128** to provide incoming e-mail messages to incoming message module **332**. When incoming message module **332** receives an incoming e-mail message, incoming message module **332** may perform one or more e-mail processing operations on the incoming e-mail message. For instance, incoming message module **332** may determine whether the incoming e-mail address includes a "to" property, a "cc" property, or a "bcc" property that specifies an e-mail address associated with an active account maintained by the computing devices **110**, **130**. In this example, incoming message module **332** may generate an outgoing "bounce" message when the "to" property, the "cc" property, or the "bcc" property of the incoming e-mail message specifies an e-mail address associated with an inactive account that was previously maintained by the computing devices **110**, **130**. After incoming message module **332** performs the e-mail processing operations on the incoming e-mail message, incoming message module **332** may provide the incoming e-mail message to conversation identification module **334**.

The item management logic **330** may include the conversation identification module **334** communicatively coupled to the incoming message module **332**. The conversation identification module **334** is operative to determine the incoming message is part of a conversation thread. The conversation identification module **334** associates the incoming message with the conversation thread by setting a conversation identifier property of the incoming message to a conversation identifier for the conversation thread.

When executed by processor **204**, conversation identification module **334** receives incoming e-mail messages from incoming message module **332** and attempts to identify an existing conversation associated with the incoming e-mail message. If conversation identification module **334** cannot successfully identify an existing conversation associated with the incoming e-mail message, conversation identification module **334** may associate the incoming e-mail message with a new conversation.

The conversation identification module **334** may determine whether a message is part of an existing conversation in a number of different ways. In one embodiment, for example, the conversation identification module **334** executes an algorithm that associates the incoming e-mail message with an existing conversation when one or more of the following conditions occur:

(1) The incoming e-mail message includes an "in-reply-to" property that specifies a value that corresponds to a value specified by a "message identifier" property of a stored message associated with the existing conversation;

(2) The incoming e-mail message includes a "references" property that specifies a value that corresponds to a value specified by a "message identifier" property of a stored message associated with the existing conversation; and

(3) A normalized "subject" property of the incoming e-mail corresponds to a normalized "subject" property of a stored message associated with the existing conversation.

The occurrence of one of these conditions may represent an exemplary set of preconditions for allowing the conversation identification module **334** to associate the incoming e-mail message with an existing conversation. There may be implementations, however, in which additional conditions could occur before the conversation identification module **334** associates the incoming e-mail message with an existing conversation. For instance, one implementation may associate a received message with an existing conversation when condition (2) occurs only if condition (1) does not occur.

Additionally or alternatively, the conversation identification module **334** does not act to associate e-mail messages with conversations. Rather, the conversation identification module **334** may perform actions to associate e-mail messages with conversations. This includes both incoming e-mail messages and outgoing e-mail messages.

After conversation identification module **334** associates the incoming e-mail message with an existing conversation or associates the incoming e-mail message with a new conversation, conversation identification module **334** may store in a message database **350** the incoming e-mail message along with a conversation identifier that identifies the conversation associated with the incoming e-mail message. In one implementation, message database **350** includes a table that includes a row for each email message and a column for each property of an e-mail message. For instance, the table may include a column for a "to" property of an e-mail message, a "from" property of the e-mail message, a "cc" property of the e-mail message, a "date" property of the email message, a "subject" property of the e-mail message, a "body" property of the email message, and so on. Furthermore, in this instance, the table may include a column for a conversation identifier that identifies the conversation associated with the e-mail message. An example is provided in Table 1 as follows:

TABLE 1

To	From	Subject	Body	Conversation Identifier	...
jones@Microsoft.com	smith@microsoft.com	Atlanta Office Closed	The Atlanta Office is closing today . . .	53713	

TABLE 1-continued

To	From	Subject	Body	Conversation Identifier	...
ybara@Microsoft.com	bamey@microsoft.com	Lunch today?	Want to get lunch at noon . . .	25415	
bamey@Microsoft.com	ybara@microsoft.com	RE: Lunch today?	Sure, where do you want to go?	25415	
ybara@Microsoft.com	bamey@microsoft.com	RE:RE: Lunch today?	Let's go to Mario's . . .	25415	
. . .	. . .	. . .	. . .	. . .	

It should be appreciated that the table may include columns for many other properties of e-mail messages. These other properties may include an "X-MimeOLE" property, a "Content-class" property, a "MIME-Version" property, a "Content-Type" property, a "Content-Transfer-Encoding" property, a "Date" property, a "Message-ID" property, an "X-MS-Has-Attach" property, a "X-MS-TNEF-Correlator" property, an "X-Priority" property, a "Priority" property, an "Importance" property, a "cc" property, a "bcc" property, and so on. Furthermore, it can easily been seen that Table 1 includes a series of e-mail messages exchanged between a person associated with the e-mail address "ybara@microsoft.com" and a person associated with the e-mail address "bamey@microsoft.com" regarding whether to get lunch. It should be noted that these e-mail messages have the same conversation identifier listed in their "conversation identifier" properties. In this way, the conversation identifiers of the "conversation identifier" properties of these e-mail messages indicate that these e-mail messages are associated with a common conversation.

The item management logic **330** may include the message retrieval module **338** communicatively coupled to the conversation manager module **336**. When executed by processor **204**, message retrieval module **338** enables users to retrieve e-mail messages stored in message database **350**. When the e-mail application **300** is implemented by the server computing device **130**, for example, message retrieval module **338** may receive periodic requests from the e-mail client application **124** on the client computing device **110** to retrieve new messages that specify an e-mail address associated with a user of the client computing device **110**. In response to such requests, message retrieval module **338** may identify any new e-mail messages in message database **350** that have not previously been sent to the client computing device **110**. If message retrieval module **338** identifies any such new e-mail messages, message retrieval module **338** may send the identified e-mail messages, along with the conversation identifiers of the e-mail messages, to the client computing device **110**. Upon receiving the identified e-mail messages, the e-mail client application on client computing device **110** may present a user interface view in which the identified e-mail messages, along with previously retrieved e-mail messages, are grouped by conversation with which the e-mail messages are associated. For instance, client computing device **110** may present a user interface view in which e-mail messages that are associated with a conversation are presented as trees of e-mail messages. In another instance, client computing device **110** may present an interface that includes separate lists of e-mail messages for each conversation.

The item management logic **330** may include the outgoing message module **340** communicatively coupled to the message retrieval module **338**. When executed by processor **204**, outgoing message module **340** enables users to send outgoing e-mail messages. For example, outgoing message module **340** may receive a request from the e-mail client application **124** on the client computing device **110** to send an outgoing e-mail message. In this example, outgoing message module **340** may associate the outgoing e-mail message with a conversation identifier and incorporate this conversation identifier into the outgoing e-mail message. After outgoing message module **340** associates the outgoing e-mail message with the conversation identifier and incorporates this conversation identifier into the outgoing e-mail message as a "conversation identifier" property of the e-mail message, outgoing message module **340** may instruct operating system **128** to send the outgoing e-mail message on network **118**.

The item management logic **330** may include the conversation manager module **336** communicatively coupled to the conversation identification module **334**. The conversation manager module **336** may be generally arranged to implement various automatic conversation techniques. The conversation manager module **336** implements automatic conversation techniques in the form of conversation level actions that may be applied across an entire conversation group or conversation thread managed by the e-mail application **300**. Conversation level actions typically affect some or all messages in the entire conversation thread. By way of contrast, item level actions typically affect a single message item.

One of the main tenets of helping users reduce information overload with the conversation functionality is giving them an easy way to act on a conversation model. The conversation model now intelligently represents the group of messages with which the user is interacting. There are two main groups of actions that the new conversation model will support. First, the conversation model promotes what were previously item-level only actions to the conversation level, and the introduction of a new set of actions specifically for conversation items. The promotion of item-level actions is about batching together actions that used to be performed individually on messages, such as "Flag," "Categorize," "Assign," and so forth, so that the user needs to set a single conversation rule for an entire conversation. For example, the user can flag a conversation thread and use that to easily flag the latest message in the conversation thread. Furthermore, having conversation-level views allows the e-mail application **300** to introduce the second category of actions, particularly those that act specifically on the conversation thread itself. These are a set of operations that leverage the semantic of a "conversation," such as always delete or always move conversation rules.

The conversation manager module **336** is operative to create a conversation rule for a conversation thread. An operator or user may create a conversation rule for a conversation thread by selecting one or more messages from a conversation thread, and assigning a conversation rule to the one or more messages. The conversation rule defines a set of conversation level actions to perform on existing and future messages

having a common conversation identifier (ID) property for a conversation thread. The existing messages may be stored in the message database **350**. The future messages may include new incoming messages to the e-mail application **300** received from a remote device across the network **118** and the network interface **220**. Some examples of conversation rules include without limitation an "always delete" conversation rule, an "always move" conversation rule, an "always categorize" conversation, among others. Each of these conversation rules are described further below.

Once the conversation manager module **336** creates a conversation rule for a conversation thread, the conversation manager module **336** stores the conversation rule in a conversation action table (CAT). The CAT is a new table designed to store the information needed to drive conversation level actions. The CAT is where a conversation "object" has an ongoing action associated with it. It is a table in the PST that contains an entry for each conversation which has an ongoing action or set of actions. The basic structure of the CAT is shown in Table 2 as follows:

TABLE 2

Example of . . .	CONVERSATION IDENTIFIER	Always Delete	Always Move		Categorize		
		Yes/No	Yes/No	Destination	Yes/No	Categories	Expiration
Always Delete	1	Yes	Yes	Deleted Items			11:08:55 Jun. 8, 2007
Always Move	2		Yes	Contoso			13:40:51 Jun. 9, 2007
Always Categorize	3				Yes	Personal, Family	07:01:11 Jun. 10, 2007

As shown in Table 2, the CAT may contain a conversation identifier, a parameter (Yes or No) to indicate whether a conversation rule is applied to the conversation identifier, and information needed to implement a given rule, such as a target folder for the always move conversation rule, or a category name for the always category conversation rule. The CAT also provides an expiration date and time to indicate when a given conversation rule is to remain in force. Whenever a new incoming message arrives at the incoming message module **332**, and the conversation identification module **334** identifies the incoming message as part of a conversation thread, the conversation manager module **336** consults the CAT the performs subsequent message handling operations on the incoming message in accordance with the various conversation rules associated with the conversation thread.

The conversation manager module **336** is operative to create an always delete conversation rule to automatically route the incoming message to a deleted items folder. The always delete conversation rule is a power-user feature that allows a user to automatically move new items that arrive in a conversation to a Deleted Items folder thereby eliminating the incoming message from an Inbox folder. A user may create an always delete conversation rule by selecting a user interface element, such as a user interface button on a user interface ribbon.

When a user selects a single conversation item, such as a message for a conversation, to bring the single conversation item in focus, and selects the user interface button for "Always Delete," the conversation manager module **336** initiates operations to create the always delete conversation rule. The conversation manager module **336** first determines if the conversation already has a pre-existing always delete conversation rule in place. This may be accomplished by checking a property on the conversation item to determine if a parent conversation item has the ongoing action associated with it. This property is set for the message when the CAT processing occurs. The conversation manager module **336** generates a user interface view such as a dialog box having the following properties as shown in Table 3:

TABLE 3

Proposed Dialog String	Option Buttons
This will move the current items in this conversation and all new items that arrive to the Deleted Items folder. Click OK to ignore this conversation.	OK CANCEL
Don't show me this dialog again.	CHECK UNCHECK

When the user clicks [OK], all of the individual messages in the current folder for the conversation are moved to the Deleted Items folder. An entry is created in the CAT for this conversation using its PR_CONVERSATION_ID if one does not exist already. New conversation items that arrive to this conversation and match the PR_CONVERSATION_ID will automatically be moved to the Deleted Items folder. This logic is subject to the expiration guidelines set in the CAT.

When multiple conversation items have focus, and a user selects the user interface button for "Always Delete," the conversation manager module **336** initiates operations to create the always delete conversation rule. The conversation manager module **336** first determines whether the current folder for the selected conversation items is the Deleted Items folder. If not, the conversation manager module **336** generates a user interface view such as a dialog box having the following properties as shown in Table 4:

TABLE 4

Proposed Dialog String	Option Buttons
This will move the current items in the selected conversations and allow new items that arrive to them to the Deleted Items folder. Click OK to ignore this conversation.	OK CANCEL
Don't show me this dialog again.	CHECK UNCHECK

When the user clicks [OK], all of the individual messages in the current folder for the selected conversations are moved to the Deleted Items folder. An entry is created in the CAT for each of the conversations using the PR_CONVERSATION_ID. New items that arrive to these conversations and match the PR_CONVERSATION_ID will automatically be moved to the Deleted Items folder. This logic is subject to the expiration guidelines set in the CAT.

A user can disable the "Always Delete" ongoing action on a conversation in a number of different ways. To disable an always delete conversation rule for a conversation, the user may go to the Deleted Items folder.

When a single conversation item has focus and is currently subject to the always delete conversation rule, and the current folder is the Deleted Items folder, then a ribbon user interface will display a "Disable Always Delete" user interface button to remove the always delete conversation rule from the conversation thread. Selecting the user interface button causes the conversation manager module **336** to generate a user interface view such as a dialog box having the following properties as shown in Table 5:

TABLE 5

Proposed Dialog String	Option Buttons
This will stop deleting new items that arrive in this conversation. Click OK to stop ignoring this conversation and move the selected conversation to the Inbox folder.	OK CANCEL
Don't show me this dialog again.	CHECK UNCHECK

When a user selects [OK], all of the individual messages in the conversation thread are moved to the Inbox folder. The conversation manager module **336** removes the corresponding entry for the always delete conversation rule from the CAT.

When multiple conversation items are in focus and are currently subject to the always delete conversation rule, and the current folder is the Deleted Items folder, then a ribbon user interface will display a "Disable Always Delete" user interface button to remove the always delete conversation rule from the conversation thread. Selecting the user interface button causes the conversation manager module **336** to generate a user interface view such as a dialog box having the following properties as shown in Table 6:

TABLE 6

Proposed Dialog String	Option Buttons
This will stop deleting new items that arrive in these conversations. Click OK to stop ignoring these conversations and move the selected conversations to the Inbox folder.	OK CANCEL
Don't show me this dialog again.	CHECK UNCHECK

When the user selects [OK], all of the individual messages in the selected conversations are moved to the Inbox folder. The conversation manager module **336** removes the corresponding entries for the always delete conversation rules from the CAT.

It is worthy to note that the conversation manager module **336** does not check the enabled/disabled state of every conversation when in a multi-select state since this could affect performance of the e-mail application **300**, such as causing a slow-down in view rendering. To improve performance, the conversation manager module **336** does not check each conversation, but rather will default to assuming all of them have the ongoing action associated with it. Alternatively, the conversation manager module **336** could check the enabled/disabled state of every conversation when in a multi-select state for a given implementation when performance is not an issue.

The conversation manager module **336** is operative to create an always move conversation rule to automatically route the incoming message to a target items folder. The always move conversation rule is another power-user feature that enables the user to easily move items in a specific conversation to a folder of their choosing. It is much lighter-weight than creating a regular rule and is accessed off of the "Move To Folder" ribbon button.

When a single conversation item has focus, and a target folder is chosen, a ribbon user interface will display a "Always Move" user interface button to initiate operations for generating an always move conversation rule to move messages to the target folder. Selecting the user interface button causes the conversation manager module **336** to generate a user interface view such as a dialog box having the following properties as shown in Table 7:

TABLE 7

Proposed Dialog String	Option Buttons
This will move the current items in this conversation and all new items that arrive to the <chosen. Folder. Click OK to always move this conversation.	OK CANCEL
Don't show me this dialog again.	CHECK UNCHECK

When the user clicks [OK], all of the individual messages in the current folder for the conversation are moved to the chosen folder. The conversation manager module **336** creates a new entry in the CAT for this conversation using its PR_CONVERSATION_ID if one does not exist already. The conversation manager module **336** evaluates and automatically moves new conversation items with a matching PR_CONVERSATION_ID to the target folder. This logic is subject to the expiration guidelines set in the CAT.

When multiple conversation items have focus, and a target folder is chosen, a ribbon user interface will display a "Always Move" user interface button to initiate operations for generating an always move conversation rule to move messages for multiple conversations to the target folder. Selecting the user interface button causes the conversation manager module **336** to generate a user interface view such as a dialog box having the following properties as shown in Table 8:

TABLE 8

Proposed Dialog String	Option Buttons
This will move the current items in these conversations and all new items that arrive to the <chosen> folder. Click OK to always move this conversation.	OK CANCEL
Don't show me this dialog again.	CHECK UNCHECK

When the user clicks [OK], all of the individual messages in the current folder for the selected conversations are moved to the chosen folder. The conversation manager module **336** creates an entry in the CAT for these conversations using their PR_CONVERSATION_ID if one does not exist already. If the PR_CONVERSATION_ID already has an always move conversation rule associated with it, this overwrites that rule. It will also reset the expiration time to a default time. New items that arrive to this conversation and match the PR_CONVERSATION_ID will automatically be moved to the selected folder. This logic is subject to the expiration guidelines set in the CAT.

There are a few exception cases for an always move conversation rule. For example, if a user chooses Deleted Items as the destination folder for the always move conversation rule, it is essentially the same as an always delete conversation rule. When the conversation is selected in the Deleted Items folder, the "Always Delete" button will toggle to its "deactivate" state.

A user can disable an always move conversation rule in a number of different ways. For example, when a single conversation item has focus, the conversation manager module **336** may determine whether the conversation item is currently subject to a pre-existing always move conversation rule. This may be accomplished by checking a property on the conversation item to determine if a parent conversation item has the ongoing action associated with it. This property is set for the message when the CAT processing occurs. A ribbon user interface will display a "Disable Always Move" user interface button to remove the always move conversation rule from the conversation thread. Selecting the user interface button causes the conversation manager module **336** to generate a user interface view such as a dialog box having the following properties as shown in Table 9:

TABLE 9

Proposed Dialog String	Option Buttons
New items in this conversation are automatically being move to the folder <chosen> folder. Click OK to stop always moving new items to the <chosen> folder.	OK CANCEL
Don't show me this dialog again.	CHECK UNCHECK

When the user clicks [OK], the conversation manager module **336** stops the ongoing always move action. The conversation manager module **336** removes the entry for the conversation thread from the CAT. The conversation items may optionally be moved or not moved from their current location based on a given implementation.

When multiple conversation items have focus, a ribbon user interface will display a "Disable Always Move" user interface button to remove the always move conversation rule from the conversation threads. Selecting the user interface button causes the conversation manager module **336** to generate a user interface view such as a dialog box having the following properties as shown in Table 10:

TABLE 10

Proposed Dialog String	Option Buttons
New items in the selected conversations are automatically being moved to other folders. Click OK to stop always moving new items to these conversations.	OK CANCEL
Don't show me this dialog again.	CHECK UNCHECK

When the user clicks [OK], the conversation manager module **336** stops the ongoing always move action for all conversations that have the action associated with them. The conversation manager module **336** removes the entries for the conversation threads from the CAT. The conversation items may optionally be moved or not moved from their current location based on a given implementation.

The conversation manager module **336** is operative to create an always categorize conversation rule to automatically assign a category for the incoming message. Assigning a category to a conversation item automatically enables ongoing categorization for the entire conversation thread.

When assigning a category using an appropriate "Always Categorize" user interface button from the ribbon user interface on a single conversation item, the selected categories are applied to all of the items in all folders for that conversation. This is an ongoing action, and a CAT entry is automatically created. This is additive to other categories that may exist for any individual messages. For example, assume a conversation thread has messages 1, 2, 3 and 4, where message 1 has a category A, message 3 has a category B, and all messages 1-4 are in an Inbox folder. If a user selects the conversation thread and applies the "Always Categorize" action with the category C, the results are additive as follows:

Message 1—Categories A+C
Message 2—Category C
Message 3—Categories B+C
Message 4—Category C

These and other concepts for the always categorize conversation item may be described in more detail with reference to FIGS. **4-8**.

FIG. **4** illustrates an embodiment of conversation views **402**, **404**. The conversation views **402**, **404** represent conversation views grouping messages by a conversation thread. The conversation views **402**, **404** illustrate multiple messages **420** each having a category indicator. In the conversation view **402**, each message **420** has a category indicator **410** that is empty thereby indicating that no category has been assigned to the corresponding message **420**. When multiple conversation items are selected, and an always categorize conversation rule is applied to all of the messages in all folders that comprise those conversations, then all of the messages **420** are assigned to the chosen category or categories as indicated by the category indicators **412** that are shaded.

FIG. **5** illustrates an embodiment of conversation views **502**, **504**. The conversation views **502**, **504** also represent conversation views grouping messages by a conversation thread. When the conversation manager module **336** is acting on messages **420** of a selected message type, such as all messages for "Randy Byrne" for example, the conversation manager module **336** applies the chosen categories to only the messages **420** of the selected message type. As shown in FIG. **5**, the conversation view **504** has assigned the chosen category to the selected messages **420** as indicated by the category indicators **412** that are shaded.

FIG. **6** illustrates an embodiment of conversation views **602**, **604**. The conversation views **602**, **604** also represent conversation views grouping messages by a conversation thread. The conversation view **602** illustrates that some of the category indicators **410** are shaded thereby indicating a category has been assigned to the corresponding messages **420**. The conversation manager module **336** may remove a category while a single conversation item is in focus. For example, when a user selects a "Clear All Categories" user interface button on the ribbon user interface, the conversation manager module **336** removes all categories from all messages in all folders. This is true even when a message **420** has multiple assigned categories, as indicated by the single category indicator **410** separated into multiple category indicators **410**. This is typically not an ongoing action. The conversation manager module **336** removes the always category conversation rule from the CAT.

FIG. **7** illustrates an embodiment of conversation views **702**, **704**. The conversation views **702**, **704** also represent conversation views grouping messages by a conversation

thread. The conversation thread **702** illustrates that some of the category indicators **410** are shaded, and further, that some of the messages **420** have multiple assigned categories as indicated by the separation of the single category indicator **410** into multiple category indicators **410** per some of the messages **420**. The conversation manager module **336** may remove a single category of the multiple categories assigned to a conversation item while a single conversation item is in focus. For example, when a user selects a "Clear A Category" user interface button on the ribbon user interface, the conversation manager module **336** removes only the chosen category from all messages in all folders. For example, the message **420** for "Michael Affronti" having two categories assigned to it is modified by the conversation manager module **336** to remove one of the two categories, as indicated by the multiple category indicators **410** becoming a single category indicator **410**. This is typically not an ongoing action. The conversation manager module **336** removes the always category conversation rule for the chosen category from the CAT. The conversation manager module **336** may apply similar logic whenever multiple conversation items are in focus when the "Clear A Category" user interface button is actuated.

FIG. **8** illustrates an embodiment of conversation views **802**, **804**. The conversation views **802**, **804** also represent conversation views grouping messages by a conversation thread. The conversation thread **802** illustrates that some of the category indicators **410** are shaded, and further, that some of the messages **420** have multiple assigned categories as indicated by the separation of the single category indicator **410** into multiple category indicators **410** per some of the messages **420**. The conversation manager module **336** may remove a single category of the multiple categories assigned to a conversation item while a single conversation item is in focus. For example, when a user selects a "Clear A Category" user interface button on the ribbon user interface, the conversation manager module **336** removes only the chosen category from all messages in all folders. For example, the message **420** for "Michael Affronti" having two categories assigned to it is modified by the conversation manager module **336** to remove one of the two categories, as indicated by the multiple category indicators **410** becoming a single category indicator **410**. Furthermore, the conversation manager module **336** may be arranged to act on messages **420** of a selected message type, such as all messages for "Michael Affronti" for example. In this case, the conversation manager module **336** only removes the chosen category or categories from the messages **420** of the same message type.

Whenever a new incoming message arrives at the incoming message module **332**, and the conversation identification module **334** identifies the incoming message as part of a conversation thread, the conversation manager module **336** determines whether a conversation rule is associated with the conversation thread, and if so, applies the conversation rule to the incoming message. The conversation manager module **336** consults the CAT and performs subsequent message handling operations on the incoming message in accordance with the various conversation rules associated with the conversation thread.

By way of example, assume a user named Michael likes to stay on top of a lot of mail during the course of the day. He has rules that move distribution list mail to different folders, but still works hard to keep track of the regular mail he receives in his Inbox. One of his colleagues starts up an e-mail thread to his team distribution list, which Michael receives in his Inbox, about the upcoming college basketball playoffs. Michael is not interested in participating in this year's pool and would like to remove the thread from his Inbox. He choose the "Always Delete" action and the entire thread is moved to his Deleted Items folder. As his colleagues continue to talk on the thread, all subsequent replies are silently placed right in Michael's Deleted Items, keeping his inbox clear of the noise of that conversation while not forcing him to make a one-off rule or remove himself from that (usually) important alias.

In another example, assume a user named Paul is a filer and constantly moves mail to different folders based on the project or person that sent it. As new conversations arrive in his inbox, Paul can easily act on just the messages that have arrived in that folder and move them to wherever he'd like. A specific conversation about the "Morandi" project pops up and continues to be active, so Paul uses the "Always Move" action to easily have new items in that conversation go the "Morandi Project" folder when they arrive.

In yet another example, assume a user named Mary categorizes new messages as they arrive. As subsequent replies arrive for a conversation, Mary needs to manually categorize each item individually each time a new one arrives. Mary uses the "Always Categorize" action to recognize that new items have arrived in the conversation and automatically apply the correct categories from the first message to the rest of the conversation.

In addition to applying conversation rules for incoming messages, the conversation manager module **336** also applies conversation rules to stored messages. The message database **350** stores a plurality of messages for each conversation thread. When the conversation manager module **336** creates a new conversation rule for the conversation thread, the conversation manager module **336** applies the conversation rule to the plurality of stored messages for the appropriate conversation thread.

Operations for the above-described embodiments may be further described with reference to one or more logic flows. It may be appreciated that the representative logic flows do not necessarily have to be executed in the order presented, or in any particular order, unless otherwise indicated. Moreover, various activities described with respect to the logic flows can be executed in serial or parallel fashion. The logic flows may be implemented using one or more hardware elements and/or software elements of the described embodiments or alternative elements as desired for a given set of design and performance constraints. For example, the logic flows may be implemented as logic (e.g., computer program instructions) for execution by a logic device (e.g., a general purpose or specific-purpose computer).

FIG. **9** illustrates one embodiment of a logic flow **900** suitable for practicing the various embodiments. The logic flow **900** may be representative of some or all of the operations executed by one or more embodiments described herein.

In the illustrated embodiment shown in FIG. **9**, the logic flow **900** may receive an incoming message at block **902**. For example, incoming message module **332** interacts with operating system **128** to receive incoming e-mail messages that are received from network **118** by network interface **220**. For instance, incoming message module **332** may use an interface provided by operating system **128** to configure a callback that causes operating system **128** to provide incoming e-mail messages to incoming message module **332**. When incoming message module **332** receives an incoming e-mail message, incoming message module **332** may perform one or more email processing operations on the incoming e-mail message. After incoming message module **332** performs the e-mail processing operations on the incoming e-mail message,

incoming message module **332** may provide the incoming e-mail message to conversation identification module **334**.

The logic flow **900** may determine the incoming message is part of a conversation thread at block **904**. For example, conversation identification module **334** receives incoming e-mail messages from incoming message module **332** and attempts to identify an existing conversation associated with the incoming e-mail message. If conversation identification module **334** cannot successfully identify an existing conversation associated with the incoming e-mail message, conversation identification module **334** may associate the incoming e-mail message with a new conversation. The conversation identification module **334** may utilize any number of different algorithms and conditions to explicitly or implicitly determine whether a message is part of a conversation thread. The embodiments are not limited in this context.

The logic flow **900** may associate the incoming message with the conversation thread at block **906**. For example, if the incoming message module **332** identifies the incoming message as part of an existing conversation thread, the conversation identification module **334** associates the incoming message with the conversation thread by assigning the incoming message a common conversation identifier in the appropriate property for the incoming message. If the incoming message module **332** does not identify the incoming message as part of an existing conversation thread, however, the conversation identification module **334** associate the incoming e-mail message with a new conversation by assigning it a new conversation identifier. After conversation identification module **334** associates the incoming e-mail message with an existing conversation or associates the incoming e-mail message with a new conversation, conversation identification module **334** may store in a message database **350** the incoming e-mail message along with a conversation identifier that identifies the conversation associated with the incoming e-mail message.

The logic flow **900** may determine a conversation rule is associated with the conversation thread at block **908**. For example, the conversation manager module **336** searches a CAT to determine whether a conversation rule is associated with the conversation thread. The conversation manager module **336** may search the CAT using any number of different search criteria, such as the conversation identifier, for example.

The logic flow **900** may apply the conversation rule to the incoming message at block **910**. For example, when the conversation manager module **336** locates a conversation rule associated with the conversation thread, the conversation manager module **336** applies the located conversation rule to the incoming message. The conversation manager module **336** performs certain message processing operations on the incoming message as defined by the conversation rule, such as deleting the incoming message, moving the incoming message, categorizing the incoming message, forwarding the incoming message to another e-mail application **300** for another user, replying to the incoming message, copying the incoming message, or any other message processing operations made available by a given e-mail application **300**. The conversation manager module **336** may also use an incoming message and corresponding conversation rule to actuate or trigger subsequent operations for other messages stored by the message database **350** or application programs executing on the computing devices **110**, **130**.

FIG. **10** illustrates a diagram an article of manufacture **1000** suitable for storing logic for the various embodiments. As shown, the article of manufacture **1000** may comprise a storage medium **1002** to store logic **1004**. Examples of the storage medium **1002** may include one or more types of computer-readable storage media capable of storing electronic data, including volatile memory or non-volatile memory, removable or non-removable memory, erasable or non-erasable memory, writeable or rewriteable memory, and so forth. Examples of the logic **1004** may include various software elements, such as software components, programs, applications, computer programs, application programs, system programs, machine programs, operating system software, middleware, firmware, software modules, routines, subroutines, functions, methods, procedures, software interfaces, application program interfaces (API), instruction sets, computing code, computer code, code segments, computer code segments, words, values, symbols, or any combination thereof.

In one embodiment, for example, the article of manufacture **1000** and/or the computer-readable storage medium **1002** may store logic **1004** comprising executable computer program instructions that, when executed by a computer, cause the computer to perform methods and/or operations in accordance with the described embodiments. The executable computer program instructions may include any suitable type of code, such as source code, compiled code, interpreted code, executable code, static code, dynamic code, and the like. The executable computer program instructions may be implemented according to a predefined computer language, manner or syntax, for instructing a computer to perform a certain function. The instructions may be implemented using any suitable high-level, low-level, object-oriented, visual, compiled and/or interpreted programming language, such as C, C++, Java, BASIC, Perl, Matlab, Pascal, Visual BASIC, assembly language, and others.

Various embodiments may be implemented using hardware elements, software elements, or a combination of both. Examples of hardware elements may include any of the examples as previously provided for a logic device, and further including microprocessors, circuits, circuit elements (e.g., transistors, resistors, capacitors, inductors, and so forth), integrated circuits, logic gates, registers, semiconductor device, chips, microchips, chip sets, and so forth. Examples of software elements may include software components, programs, applications, computer programs, application programs, system programs, machine programs, operating system software, middleware, firmware, software modules, routines, subroutines, functions, methods, procedures, software interfaces, application program interfaces (API), instruction sets, computing code, computer code, code segments, computer code segments, words, values, symbols, or any combination thereof. Determining whether an embodiment is implemented using hardware elements and/or software elements may vary in accordance with any number of factors, such as desired computational rate, power levels, heat tolerances, processing cycle budget, input data rates, output data rates, memory resources, data bus speeds and other design or performance constraints, as desired for a given implementation.

Some embodiments may be described using the expression "coupled" and "connected" along with their derivatives. These terms are not necessarily intended as synonyms for each other. For example, some embodiments may be described using the terms "connected" and/or "coupled" to indicate that two or more elements are in direct physical or electrical contact with each other. The term "coupled," however, may also mean that two or more elements are not in direct contact with each other, but yet still cooperate or interact with each other.

It is emphasized that the Abstract of the Disclosure is provided to comply with 37 C.F.R. Section 1.72(b), requiring an abstract that will allow the reader to quickly ascertain the nature of the technical disclosure. It is submitted with the understanding that it will not be used to interpret or limit the scope or meaning of the claims. In addition, in the foregoing Detailed Description, it can be seen that various features are grouped together in a single embodiment for the purpose of streamlining the disclosure. This method of disclosure is not to be interpreted as reflecting an intention that the claimed embodiments require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive subject matter lies in less than all features of a single disclosed embodiment. Thus the following claims are hereby incorporated into the Detailed Description, with each claim standing on its own as a separate embodiment. In the appended claims, the terms "including" and "in which" are used as the plain-English equivalents of the respective terms "comprising" and "wherein," respectively. Moreover, the terms "first," "second," "third," and so forth, are used merely as labels, and are not intended to impose numerical requirements on their objects.

Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

The invention claimed is:

1. An article comprising a tangible computer-readable memory storage containing instructions that, when executed by a computer system, cause the computer system to:

display a ribbon user interface comprising a first dialog box, the first dialog box having a first option button for ignoring a conversation comprising a plurality of stored e-mail messages, the plurality of stored e-mail messages being stored across a plurality of storage locations;

receive a selection of the first option button;

move the plurality of stored email messages from the plurality of storage locations to a specified folder in response to receiving the selection of the first option button; and

display, on the computing device, the ribbon user interface comprising a second dialog box, the second dialog box having a second option button to stop ignoring the conversation, wherein selecting the second option button to stop ignoring the conversation stops ignoring the plurality of stored conversation items that were moved to the specified folder by removing the plurality of stored conversation items from the specified folder and returning the plurality of stored conversation items to the plurality of storage locations.

2. The article of claim **1**, wherein the instructions further cause the computer system to create an entry in a conversation action table for the conversation using a conversation ID.

3. The article of claim **2**, wherein the instructions further cause the computer system to:

receive one or more new e-mail messages for the conversation; and

automatically move the one or more new e-mail messages to the selected folder when the one or more new e-mail messages matches the conversation ID.

4. The article of claim **2**, wherein the instructions further cause the computer system to remove an entry for an always delete conversation rule from a conversation action table.

5. An apparatus comprising:

a memory for storing executable program code; and

a processor, functionally coupled to the memory, the processor being responsive to computer-executable instructions contained in the program code and operative to:

display a ribbon user interface comprising a first dialog box, the first dialog box having a first option button for ignoring a plurality of conversations, each of the plurality of conversations comprising one or more stored conversation items, the one or more stored conversation items being stored across a plurality of storage locations;

receive a selection of the first option button;

move the one or more stored conversation items in each of the plurality of conversations from the plurality of storage locations to a selected folder in response to receiving the selection of the first option button; and

display, on the computing device, the ribbon user interface comprising a second dialog box, the second dialog box having a second option button to stop ignoring the conversation, wherein selecting the second option button to stop ignoring the conversation stops ignoring the plurality of stored conversation items that were moved to the selected folder by removing the plurality of stored conversation items from the selected folder and returning the plurality of stored conversation items to the plurality of storage locations.

6. The apparatus of claim **5**, wherein the processor is further operative to create an entry in a conversation action table for each of the plurality of conversations using a conversation ID.

7. The apparatus of claim **6**, wherein the processor is further operative to:

receive one or more new conversation items for one or more of the plurality of conversations; and

automatically move the one or more new conversation items for the one or more of the plurality of conversations to the selected folder when the one or more new conversation items matches the conversation ID.

8. The apparatus of claim **7**, wherein the one or more new conversation items comprises one or more new e-mail messages.

9. The apparatus of claim **7**, wherein the one or more stored conversation items comprises one or more stored e-mail messages.

10. The apparatus of claim **5**, wherein the processor is further operative to remove one or more corresponding entries for always delete conversation rules from a conversation action table.

11. A method implemented on a computing device, comprising:

displaying a ribbon user interface comprising a first option for ignoring a conversation, the conversation comprising a plurality of stored conversation items, the plurality of stored conversation items being stored across a plurality of storage locations;

receiving, from a user, a selection of the first option to ignore the conversation;

moving, by the computing device, the plurality of stored conversation items associated with the conversation from the plurality of storage locations to a specified folder in response to receiving the user selection to ignore the conversation;

displaying the ribbon user interface further comprising a second option and receiving, from the user, a selection of the second option to stop ignoring the conversation; and

moving, by the computing device, the plurality of stored conversation items from the specified folder back to the

plurality of storage locations in response to receiving the selection to stop ignoring the conversation.

12. The method of claim **11**, further comprising creating an entry in a conversation action table for the conversation using a conversation ID.

13. The method of claim **12**, further comprising:

receiving one or more new conversation items for the conversation; and

automatically moving the one or more new conversation items to the specified folder when the one or more new conversation items matches the conversation ID.

14. The method of claim **13**, wherein receiving one or more new conversation items for the conversation comprises receiving one or more new e-mail messages for the conversation.

15. The method of claim **11**, wherein moving, by the computing device, the plurality of stored conversation items to the specified folder in response to receiving the selection to ignore the conversation comprises moving a plurality of stored e-mail messages to a deleted items folder.

16. The method of claim **11**, further comprising:

moving the plurality of conversation items in the conversation to an inbox folder in response to receiving the selection to stop ignoring the conversation.

17. The method of claim **16**, further comprising removing an entry for an always delete conversation rule from a conversation action table.

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